

Date: Thu, 24 Mar 94 03:41:12 PST
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>
Errors-To: Info-Hams-Errors@UCSD.Edu
Reply-To: Info-Hams@UCSD.Edu
Precedence: Bulk
Subject: Info-Hams Digest V94 #323
To: Info-Hams

Info-Hams Digest Thu, 24 Mar 94 Volume 94 : Issue 323

Today's Topics:

Daily Summary of Solar Geophysical Activity for 22 March
Grid Squares & Lat/Long
Grounding and lightning protection--KE4ZV (2 msgs)
Kenwood (TS-850) Computer Interface Info Wanted
Latest FCC issued call signs
Parts for Heathkit???
software-general exam
Who Brian is

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available (by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text herein consists of personal comments and does not represent the official policies or positions of any party. Your mileage may vary. So there.

Date: Tue, 22 Mar 1994 21:09:29 MST
From: ihnp4.ucsd.edu!usc!yeshua.marcam.com!zip.eecs.umich.edu!
newsxfer.itd.umich.edu!nntp.cs.ubc.ca!alberta!ve6mgs!usenet@network.ucsd.edu
Subject: Daily Summary of Solar Geophysical Activity for 22 March
To: info-hams@ucsd.edu

DAILY SUMMARY OF SOLAR GEOPHYSICAL ACTIVITY

22 MARCH, 1994

(Based In-Part On SESC Observational Data)

SOLAR AND GEOPHYSICAL ACTIVITY INDICES FOR 22 MARCH, 1994

NOTE: A large region of stratospheric warming exists from southern to eastern Europe and southwestern Siberia, and is strengthening. Warm air is spreading north and northeastwards.

!!BEGIN!! (1.0) S.T.D. Solar Geophysical Data Broadcast for DAY 081, 03/22/94
10.7 FLUX=091.1 90-AVG=106 SSN=035 BKI=4222 4322 BAI=013
BGND-XRAY=A7.7 FLU1=7.1E+06 FLU10=1.8E+04 PKI=4323 5333 PAI=018
BOU-DEV=067,017,011,018,066,028,017,016 DEV-AVG=030 NT SWF=00:000
XRAY-MAX= B3.0 @ 0644UT XRAY-MIN= A6.8 @ 0935UT XRAY-AVG= B1.0
NEUTN-MAX= +003% @ 0005UT NEUTN-MIN= -002% @ 1350UT NEUTN-AVG= +0.2%
PCA-MAX= +0.1DB @ 2350UT PCA-MIN= -0.2DB @ 2315UT PCA-AVG= -NANDB
BOUTF-MAX=55344NT @ 0126UT BOUTF-MIN=55306NT @ 1803UT BOUTF-AVG=55330NT
GOES7-MAX=P:+000NT@ 0000UT GOES7-MIN=N:+000NT@ 0000UT G7-AVG=+072,+000,+000
GOES6-MAX=P:+126NT@ 1735UT GOES6-MIN=N:-088NT@ 0449UT G6-AVG=+091,+021,-042
FLUXFCST=STD:090,090,085;SESC:090,090,085 BAI/PAI-FCST=015,010,010/020,015,015
KFCST=3223 2111 3223 4111 27DAY-AP=011,005 27DAY-KP=2333 2232 1112 2121
WARNINGS=
ALERTS=
!!END-DATA!!

NOTE: The Effective Sunspot Number for 21 MAR 94 is not available.
The Full Kp Indices for 21 MAR 94 are: 3o 6- 4o 4o 4- 4o 4- 3-
The 3-Hr Ap Indices for 21 MAR 94 are: 15 65 26 30 21 28 21 13
Greater than 2 MeV Electron Fluence for 22 MAR is: 1.6E+08

SYNOPSIS OF ACTIVITY

Solar activity was very low. Region 7693 (N08W56) showed some growth early in the period but was quiet and stable. A hedge-row prominence was visible on east limb throughout the day.

Solar activity forecast: solar activity is expected to be very low to low.

The geomagnetic field ranged from quiet to minor storm levels. The more disturbed periods were 0000-0300Z and 0900-1800Z, and the other times were typically quiet to unsettled.

Geophysical activity forecast: the geomagnetic field is expected to be unsettled to active for the next 24 hours. Con-

ditions should be predominantly unsettled for the second and third days although there may be occasional brief periods of active levels.

Event probabilities 23 mar-25 mar

Class M	01/01/01
Class X	01/01/01
Proton	01/01/01
PCAF	Green

Geomagnetic activity probabilities 23 mar-25 mar

A. Middle Latitudes	
Active	25/25/10
Minor Storm	25/10/05
Major-Severe Storm	10/05/01
B. High Latitudes	
Active	25/25/10
Minor Storm	30/10/05
Major-Severe Storm	10/05/01

HF propagation conditions were slightly below normal over the high and polar latitude regions for the first half of the UTC day, but improved to near normal by the end of the day. Near-normal propagation conditions are expected over all regions during the next 72 hours through 25 March inclusive although a few periods of night-sector high-latitude minor signal degradation will remain possible.

COPIES OF JOINT USAF/NOAA SESC SOLAR GEOPHYSICAL REPORTS

REGIONS WITH SUNSPOTS. LOCATIONS VALID AT 22/2400Z MARCH

NMBR	LOCATION	LO	AREA	Z	LL	NN	MAG	TYPE
7692	N18W19	159	0030	CSO	04	003	BETA	
7693	N08W56	196	0070	CSO	06	012	BETA	
7688	N19W88	228					PLAGE	

REGIONS DUE TO RETURN 23 MARCH TO 25 MARCH

NMBR	LAT	LO
7686	N08	037

LISTING OF SOLAR ENERGETIC EVENTS FOR 22 MARCH, 1994

BEGIN MAX END RGN LOC XRAY OP 245MHZ 10CM SWEEP
NONE

POSSIBLE CORONAL MASS EJECTION EVENTS FOR 22 MARCH, 1994

BEGIN MAX END LOCATION TYPE SIZE DUR II IV
NO EVENTS OBSERVED

INFERRED CORONAL HOLES. LOCATIONS VALID AT 22/2400Z

ISOLATED HOLES AND POLAR EXTENSIONS
EAST SOUTH WEST NORTH CAR TYPE POL AREA OBSN
70 N40W12 S26W34 S04W62 N48W14 175 ISO POS 023 10830A
71 S14E38 S20E28 S10E26 S10E26 106 ISO POS 002 10830A

SUMMARY OF FLARE EVENTS FOR THE PREVIOUS UTC DAY

Date Begin Max End Xray Op Region Locn 2695 MHz 8800 MHz 15.4 GHz

21 Mar: 1056 1114 1126 SF 7693 N07W36
1130 1130 1134 SF 7693 N07W36
1548 1625 1703 B8.2 SF 7688 N21W68
1755 1758 1803 B3.1 SF 7693 N10W39
1906 1913 1926 B3.6 SF 7693 N08W40
2138 2150 2204 B3.2

REGION FLARE STATISTICS FOR THE PREVIOUS UTC DAY

C M X S 1 2 3 4 Total (%)
-- -- -- -- --
Region 7688: 0 0 0 1 0 0 0 0 001 (16.7)
Region 7693: 0 0 0 4 0 0 0 0 004 (66.7)
Uncorrelated: 0 0 0 0 0 0 0 0 001 (16.7)

Total Events: 006 optical and x-ray.

EVENTS WITH SWEEPS AND/OR OPTICAL PHENOMENA FOR THE LAST UTC DAY

Date Begin Max End Xray Op Region Locn Sweeps/Optical Observations

NO EVENTS OBSERVED.

NOTES:

All times are in Universal Time (UT). Characters preceding begin, max, and end times are defined as: B = Before, U = Uncertain, A = After. All times associated with x-ray flares (ex. flares which produce associated x-ray bursts) refer to the begin, max, and end times of the x-rays. Flares which are not associated with x-ray signatures use the optical observations to determine the begin, max, and end times.

Acronyms used to identify sweeps and optical phenomena include:

II	= Type II Sweep Frequency Event
III	= Type III Sweep
IV	= Type IV Sweep
V	= Type V Sweep
Continuum	= Continuum Radio Event
Loop	= Loop Prominence System,
Spray	= Limb Spray,
Surge	= Bright Limb Surge,
EPL	= Eruptive Prominence on the Limb.

** End of Daily Report **

Date: Wed, 23 Mar 1994 22:46:04 GMT
From: world!drt@uunet.uu.net
Subject: Grid Squares & Lat/Long
To: info-hams@ucsd.edu

Jay Sissom (JAY@medicine.dmed.iupui.edu) wrote:
: Hello!

: I recently borrowed a GPS device to calculate my Latitude & Longitude. I
: found a couple of basic programs on Compuserve to calculate my grid square
: from this info. Either something is wrong with the program, or something is
: wrong with the ARRL map in one of their books. Here is my lat/long:

: Latitude: 39' 39.303 N
: Longitude: 89' 10.550 W

: When I feed these numbers into the programs, I get EM59JP. When I look on the
: map, EM59 is in Illinois and I live in Indianapolis, IN. Is the map wrong, or
: is the basic program wrong?

: Thanks

: Jay
: KA9OKT

Well, the World Almanac says the coordinates for Indianapolis are

39.7678 N
86.1628 W

So I'd say that, gadget or no gadget, your Lat/Long figures are wrong.

-drt

David R. Tucker KG2S drt@world.std.com

Date: Wed, 23 Mar 1994 18:51:39 GMT
From: ihnp4.ucsd.edu!pacbell.com!uop!csus.edu!netcom.com!wa2ise@network.ucsd.edu
Subject: Grounding and lightning protection--KE4ZV
To: info-hams@ucsd.edu

In article <Cn41oy.L6@hpmqmoa.sqf.hp.com> dstock@hpmqmoa.sqf.hp.com (David Stockton) writes:

>: or 5.11 kW-hr. That's 18.396 Megajoules.

>

>: Gary

>

> That sounds much more like the kind of numbers I wouldn't want to be
>anywhere near !

>

> The ground rod itself will be a small fraction of the resistance and
>so get a small fraction of the energy, it will be the ground around the
>rod that takes the brunt. Instant steam explosion?

>

About 30 years ago, lightning hit a tree in my parent's house's
backyard. Boom! Wooden schrapnel all over the backyard! Good
thing we were all inside the house. Probably a steam explosion in
the tree.

A day without netnews is like a day without sunshine!

Date: Thu, 24 Mar 1994 00:34:03 GMT
From: ihnp4.ucsd.edu!swrinde!gatech!wa4mei!ke4zv!gary@network.ucsd.edu

Subject: Grounding and lightning protection--KE4ZV
To: info-hams@ucsd.edu

In article <Cn4ywC.62s@hpcvsnz.cv.hp.com> tomb@lsid.hp.com (Tom Bruhns) writes:
>Re: lightening strikes to ground rods, etc.

>

>Gotta be a little careful assuming things stay linear at power levels
>like lightening can deliver. 4000 amps * 200 ohms is 800kV, and
>that's got a pretty good probability of ionizing the surrounding
>material, yielding a dynamic resistance that could be a small fraction
>of an ohm (or even negative), disallowing such a high potential drop.

That's true, at least to an extent. The main mechanism for conduction in soil is sparking from soil grain to soil grain. The biggest current limiter in soil is the charge saturation that occurs in the vicinity of the rod. The mechanisms can be complex, and dependent on soil characteristics and soil moisture. 230 ohms is just a typical value for the mythical typical conditions, sort of like the typical American family with 2.3 kids. :-)

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

Date: 23 Mar 1994 20:02:50 -0500
From: ihnp4.ucsd.edu!galaxy.ucr.edu!library.ucla.edu!europa.eng.gtefsd.com!
news.umbc.edu!eff!news.kei.com!ddsw1!panix!not-for-mail@network.ucsd.edu
Subject: Kenwood (TS-850) Computer Interface Info Wanted
To: info-hams@ucsd.edu

A friend is interested in getting details about the computer interface "box" used with the Kenwood TS-850. Has anybody built one for themselves (rather than buying Kenwood's)? Does anybody have schematics? I'm sure that recommendations of commercially available software and other hints and kinks would be appreciated as well. Email to me (adam@panix.com) and I'll forward your replies.

-Thanx

-Adam (N2DHH)

Date: Wed, 23 Mar 1994 19:25:17 GMT

From: ihnp4.ucsd.edu!swrinde!emory!europa.eng.gtefsd.com!howland.reston.ans.net!
news.intercon.com!psinntp!psinntp!psinntp!arrl.org!gswanson@network.ucsd.edu
Subject: Latest FCC issued call signs
To: info-hams@ucsd.edu

List of the last call sign issued AS OF MARCH 1, 1994
Per the FCC:

Note: "-----" = out of calls in that group, default to next Group
to the right. Example: In Radio District 0, they are out of
Group C calls, so they are issuing from Group D for Tech/Gen.

Radio District	Group A (Extra)	Group B (Advanced)	Group C (Tech/Gen)	Group D (Novice)
0	AA0QI	KG0LO	-----	KB0LYV
1	AA1IV	KD1TZ	N1RMF	KB1BGS
2	AA2RH	KF2UA	N2YBR	KB2QXD
3	AA3HG	KE3MC	N3RPA	KB3BBC
4	AD4QG	KR4NY	-----	KE4KAL
5	AB5TB	KJ5VI	-----	KC5FON
6	AC6AP	KN6YT	-----	KE6FTE
7	AB7BL	KI7WH	-----	KC7BDO
8	AA8OI	KG8HH	-----	KB8RSM
9	AA9KI	KF9UM	N9WHC	KB9IXF
Hawaii	-----	AH6NF	WH6SV	WH6CRD
Alaska	-----	AL7PO	WL7QW	WL7CHL
Puerto Rico	-----	KP4WM	-----	WP4MNW
Guam	WH2D	AH2CU	KH2JB	WH2ANK
Virgin Islands	WP2G	KP2CC	NP2HG	WP2AHU
Amer. Samoa	AH8I	AH8AG	KH8BB	WH8ABB

For more information about call sign assignment in the Amateur Radio
Service see Section 97.17(f) of the FCC Rules.

73, Glenn KB1GW (ARRL/VEC)

Date: 23 Mar 94 04:21:00 GMT
From: ihnp4.ucsd.edu!swrinde!gatech!concert!news.duke.edu!duke!wolves!psybbs!
fredmail@network.ucsd.edu
Subject: Parts for Heathkit???
To: info-hams@ucsd.edu

MA>From my understanding of things, Heatkit as we knew is is out
MA>of business. Is there a source where I can pick up replacement

MA>parts for one of their kits? Specifically the 51-120 Audio
MA>Transformer.
MA>Thanks!
MA>Matt Adair

Hi Matt! What is this xfmr in?? 73 de WB4IUY

X OLX 2.2 X ...As I said before, I never repeat myself.

Date: Wed, 23 Mar 1994 05:11:12 GMT
From: ihnp4.ucsd.edu!agate!msuinfo!netnews.upenn.edu!iat.holonet.net!pubcon!
joe.coles@network.ucsd.edu
Subject: software-general exam
To: info-hams@ucsd.edu

IF anyone knows of the existance of a shareware/freeware program that
presents random questions from the current General exam (a practive exam
program), please let me know where I might download a copy.

Thanks,
Joe Coles
jcoles@pubcon.fort-worth.tx.us
KC5BSK

Date: Thu, 24 Mar 1994 02:58:58 GMT
From: ihnp4.ucsd.edu!galaxy.ucr.edu!library.ucla.edu!news.ucdavis.edu!
chip.ucdavis.edu!ez006683@network.ucsd.edu
Subject: Who Brian is
To: info-hams@ucsd.edu

alan v. cook (alan_v._cook@smtpgty.anatcp.rockwell.COM) wrote:

: Perhaps someone should explain to Jeff who Brian is, what Brian stands
: for, and why, if Brian decides it should be so, almost no one will be
: able to hear him. I'd do it, but it might be more fun to watch Jeff
: squirm a little...

I don't know if Jeff knows who Brian is or not. I don't think that being
eliminated from the digests will cause one to be heard by "almost no one"
though. It is an interesting point though. I never thought about the
fact that the digests were censored. Have they been previously? I always
thought the digests on QRZ? were unadulteraated from their news origin,
except headers etc. I know that the readership numbers are occasionally
posted but I've never seen anything regarding the size of the digest

subscription list.

cheers,
Dan

--

```
*-----*
* Daniel D. Todd      Packet: KC6UUD@KE6LW.#nocal.ca.usa      *
*                    Internet: ddtodd@ucdavis.edu              *
*                    Snail Mail: 1750 Hanover #102              *
*                    Davis CA 95616                            *
*-----*
* All opinions expressed herein are completely fictitious any  *
* resemblance to actual opinions of persons living or dead is  *
* completely coincidental.                                     *
*-----*
```

Date: Wed, 23 Mar 1994 23:40:07 GMT
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!gatech!wa4mei!ke4zv!
gary@network.ucsd.edu
To: info-hams@ucsd.edu

References <1994Mar23.000101.38868@rs6000.cmp.ilstu.edu>,
<1994Mar23.125211.19448@ke4zv.atl.ga.us>, <1994Mar23.174258.8681@arrl.org>
Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)
Subject : Re: Telecom and Meteors

In article <1994Mar23.174258.8681@arrl.org> zlau@arrl.org (Zack Lau (KH6CP))
writes:

>Gary Coffman (gary@ke4zv.atl.ga.us) wrote:
>

>: We're talking about the constant rain of micrometeoroids here, not the
>: big visible ones. Individual "pings" are short, but there's a constant
>: source of them. Hams who work meteor scatter tend to wait for the big
>: meteor storms and use the longer, and rarer, pings off the larger trails,
>: but that's not necessary. Only if you use analog voice or hand keyed
>: Morse are the longer pings needed. If you use digital burst communications,
>: and good FEC, you can take advantage of the constant supply of short pings
>: available from micrometeoroids.

>

>Long bursts are also needed for AX.25 packet. I don't believe amateurs
>have actually developed an optimized data system to take advantage of
>meteor scatter. I'd estimate that there are approximately 0 data
>links in the amateur service that rely on meteor scatter right now.
>I suspect that amateurs are still busy working on other options that
>seem offer more capability.

It's certainly true that typical amateur grade packet is not suited to meteor burst communications. Ralph Wallio conducted some tests at 1200 baud a few years ago. With short packets (<40 char) some complete packets make it, but the trail dies before the ACK can be sent, except during showers. Higher speeds would be helpful, but the FCC limits us to 19.6 kb on 50 MHz, and really fast TR turnarounds are needed. AMTOR sort of works, but it doesn't utilize the pings very effectively.

What we really need, however, is a different approach. In the first place, we need to be operating full duplex. With both ends transmitting continuously, any path is immediately obvious to both ends, and as much data can be pushed through as possible during each ping. We also need to use a selective broadcast protocol rather than a stop and wait protocol. Each side pushes their message through to it's end, and repeats only those parts unacknowledged until no unacknowledged data remains. The receivers then assemble the messages from the received fragments.

Using FEC may or may not be a win here. I think it may, Paul seems to think it won't. But I want to apply it somewhat differently than the usual case. I want to use the method used in D2 digital videotape. This technique "smears" errors across the matrix such that no long burst errors are contained in any single FEC protected block. The way this is done is to read a frame into a matrix by rows, calculate FEC values by column and store them in the last row, calculate a cross FEC by row and store it in the last column, and then read out the data for transmission in reverse order by columns. If we keep the frame size such that a frame can be sent in under a second, about 1500 characters if we use 19.6 kb, then on average we should get a frame through per ping. Since the pings are generally underdense, and have some doppler, I think the block encoded FEC frames will have a much better chance of being reconstructed whole than would unprotected blocks.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

Date: Thu, 24 Mar 1994 01:55:56 GMT

From: ihnp4.ucsd.edu!library.ucla.edu!europa.eng.gtefsd.com!emory!wa4mei!ke4zv!
gary@network.ucsd.edu

To: info-hams@ucsd.edu

References <1994Mar23.000101.38868@rs6000.cmp.ilstu.edu>,
<1994Mar23.125211.19448@ke4zv.atl.ga.us>,
<paulf.764453359@abercrombie.Stanford.EDU>
Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)
Subject : Re: Telecom and Meteors

In article <paulf.764453359@abercrombie.Stanford.EDU>
paulf@abercrombie.Stanford.EDU (Paul Flaherty) writes:
>gary@ke4zv.atl.ga.us (Gary Coffman) writes:

>
>>If you use digital burst communications, and good FEC, you can take advantage
>>of the constant supply of short pings available from micrometeoroids.
>
>Actually, there's some question as to the utility of FEC for MBC systems.
>Since trail dissipation is a rapid exponential process, signals tend to
>fall below threshold, on average, in the middle of packets; the required
>overhead to correct half a packet is quite large, and since one could
>potentially use those overhead bits to send real information, you're much
>better off with some sort of a selective retransmission system.

If the system is falling below threshold in the middle of packets, your
packets are too long. :-)

Seriously, I think what you're trying to say is that on average the
last frame of a series is lost in the middle. But what that actually
means is that for any given last frame, *some* of the frame is lost,
in a range from 99% to 1%, that averages over time to 50%. That means
in turn that some frames can be recovered with minor overhead, some
can be recovered with major overhead, and a few are too far gone to
recover at all.

If the last of a series of frames sent during a burst were all that
were lost, then I'd agree that FEC is probably not worth the effort.
But with the underdense pings we're discussing, that's not the case.
The channel will be noisy, and subjected to doppler throughout. What
FEC buys us is a good chance to salvage those frames that are sent
before the trail decays beyond recovery.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

Date: Thu, 24 Mar 1994 03:00:16 GMT

From: ihnp4.ucsd.edu!swrinde!gatech!wa4mei!ke4zv!gary@network.ucsd.edu
To: info-hams@ucsd.edu

References <2m19q1\$25h@hplvec.lvld.hp.com>, <2mn2rd\$ol0@vixen.cso.uiuc.edu>,
<1994Mar23.162557.7558@arrl.org>

Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)

Subject : Re: RF and AF speech processors. Was: FT-990 vs TS-850

In article <1994Mar23.162557.7558@arrl.org> zlau@arrl.org (Zack Lau (KH6CP))
writes:

>Ignacy Misztal (ignacy@ux2.cso.uiuc.edu) wrote:

>

>: I am wondering why the QST reviews do not mention the type of processing,
>: which has a large effect on signal quality. Signals with audio processing
>: have higher content of AF harmonics, and are subsequently less efficient

>

>I don't understand why audio processing has to result in more audio
>harmonics. Aren't there digital signal processing algorithms that
>could prevent this effect? Even before DSP, didn't people use split
>band audio processing to reduce the content of harmonics?

Sure, and still do in broadcasting, but it isn't either easy or cheap,
and the results still aren't that great. You have to process in 1/3
octave bands, and there are a lot of them at the lower end of the
voice spectrum. You also have to adopt a control strategy that doesn't
alter the amplitude relationships between octaves too much, or the
time relationships *at all*, otherwise you screw up the frequency
and phase response on a dynamic basis. That sounds *really* bad,
worse than just harmonic distortion. Broadcast engineers seem to
spend half their lives tinkering with the audio processing equipment.
It's really easier to modulate, limit at RF, filter, and demodulate
again rather than process properly at AF.

Gary

--

Gary Coffman KE4ZV		You make it,		gatech!wa4mei!ke4zv!gary
Destructive Testing Systems		we break it.		uunet!rsiatl!ke4zv!gary
534 Shannon Way		Guaranteed!		emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244				

End of Info-Hams Digest V94 #323
